

STATE OF COLORADO

DEPARTMENT OF TRANSPORTATION
4201 E. Arkansas Avenue
Denver, Colorado 80222



January 11, 2002

Mr. William C. Jones
Division Administrator
Federal Highway Administration
555 Zang St., Room 250
Lakewood, CO 80228

Subject: Docket # FHWA-2001-8954
National Bridge Inspection Standards (NBIS)
Advance notice of proposed rulemaking -- request for comments

Dear Mr. Jones,

My bridge staff has prepared the following comments to the FHWA's docket # FHWA-2001-8954, regarding the National Bridge Inspection Standards. In the form of this letter these comments will be submitted electronically to the U.S. Department of Transportation's Docket Management Facility.

Currently the regulation uses the AASHTO definition of a bridge to determine which structures are to be inspected. Succinctly, this definition is: any structure having an opening not less than twenty feet that forms part of a highway or that is located over or under a highway. Should the FHWA develop its own definition of a bridge for the purpose of inspection and inventory?

Although it would increase the scope of the NBIS program without increasing the associated funds, it is desirable to expand the definition of eligible structures. There are structures not included in the current definition that are an essential, and growing, part of the national infrastructure. Incorporating these structures into the successful NBIS program provides the most cost effective method for managing these structures.

The Colorado Department of Transportation (CDOT) would be interested in expanding the definition to include non-buried structures carrying vehicle traffic and having an opening not less than ten or twelve feet. The appropriate inspection interval, possibly different than the current regulations for 2 or 4 years, would need to be selected for the additional structures.

CDOT will be interested in whether or not the FHWA receives comments regarding structures that are not highway bridges; e.g., major retaining walls directly supporting highway embankments, pedestrian bridges that do not cross highways, tunnels, historical bridges removed from the NBI system with HBRRP funds, and sign and signal structures that cross over highways. CDOT is especially interested in non-redundant, fracture critical, overhead sign and signal structures, which in addition to presenting an asset management issue, also pose a significant public safety issue. Although 23USC151 only addresses “highway bridges”, the asset management and safety issues for other structures that parallel those of bridges eventually need to be addressed, and the NBIS presents an effective model for managing these assets.

The FHWA should not develop “its own” definition. If changes are made, they should be made as necessary to maintain full compatibility between AASHTO and the FHWA.

The FHWA is considering changing the five-year underwater inspection intervals and developing intervals that are tied to pile or foundations materials as well as the environment where the bridge is located.

An interval based on site specific conditions would be desirable, but CDOT would prefer a conservative tendency to any changes until more reliable methods of measuring and predicting scour are developed. In addition to assessing structural condition, underwater inspections in Colorado have provided important warning of scour vulnerability. Changes in channel alignment have had a profound affect on the scour at some bridges in Colorado, and these changes are difficult to predict. This is but one example of why changes in the inspection interval should be conservative. Reliable remote warning systems for scour critical locations are needed to fully relax underwater inspection standards.

Should the FHWA provide guidance within the regulations to address scour, including guidance for what public authorities should do after major storm events, by including in the regulations the FHWA Technical Advisory T 5140.23?

CDOT has effectively adopted TA5140.23 as policy and therefore incorporating this document in the regulations would have minor consequences on CDOT; however, it is undesirable to increase regulations in this area unless there are significant problems nationally. Scour measuring and prediction is an emerging field. Guidance is appropriate, but the regulations are generally not the best location for guidance.

Should the 4-year maximum inspection interval for bridges be increased? What would be a reasonable interval?

Lengthening the maximum interval between complete inspections should be considered. Having a different interval for the inspection of only critical elements should also be considered, especially if the interval between complete inspections is lengthened.

The decision to increase the interval beyond 2 years for the complete inspection of a particular bridge should be based on established structure condition criteria instead of FHWA written approval. For example: The initial interval could be 2 years. After a complete re-inspection if there were no significant changes in the structure’s condition, the inspection interval for a

complete re-inspection could be progressively increased, up to 6 years maximum. If there were significant changes in condition, the interval would revert back to 2 years.

A six-year maximum interval between complete inspections should be considered for culverts; and jointless conventional bridges with pretensioned concrete, internally post-tensioned concrete, and rolled wide flange steel superstructures. Any lengthening of inspection intervals should be optional, to allow the local jurisdiction to take site-specific consideration into account when establishing the interval for a particular structure. For example, the maximum interval should probably be two years for a rural bridge that is not observed on a regular basis by the owner's maintenance forces.

An interval of two years or less should be considered for partial inspections to address critical elements such as fracture critical members, problematic fatigue details (e.g., cover plates, shear and pin connections in primary steel members, cross bracing connections not fixed to flanges), primary members with less than 16' vertical clearance to a roadway, structural members at or below bridge deck joints in areas where deicing chemicals are used, bridge rails, modular expansion devices, and scour critical foundations. Scour critical structures should also have a partial inspection immediately after high water events.

Structure elements in a condition of active deterioration (e.g. some older unprotected bridge decks in areas where de-icing chemical are used) should be inspected frequently. These elements would not require a special partial structure inspection if the maximum intervals for complete inspections decreased with changes in structure condition.

Should the registered professional engineer (P.E.) who is in charge of inspection and inventory have the same training as bridge inspectors and have additional experience in bridge inspection?

The individual in charge of inspection and inventory should have the same training as required for bridge inspectors and should have successfully completed this training within one year of appointment to the position. When in the NBIS a P.E. license is used as a substitution for years of bridge inspection experience, the licensed individual should have at least five years of experience in bridge design, bridge construction, or bridge inspection. This experience can include that used to obtain the P.E. license.

Should the NBIS requirements for a registered professional engineer be made specific to the discipline of the engineer as a civil or structural engineer?

The NBIS requirements for a registered professional engineer should be made specific to the discipline of the engineer; however, since registration in many states is not discipline specific, this should be administered by an experience requirement. When in the NBIS a P.E. license is used as a substitution for years of bridge inspection experience, the licensed individual should have at least five years of experience in bridge design, bridge construction, or bridge inspection. This experience can include that used to obtain the P.E. license.

Should the NBIS requirements for an inspection team leader be expanded to include a registered Engineer-in-Training (EIT) with appropriate bridge inspection training and a minimum of 2 years of bridge design, inspection or construction experience?

Expanding the NBIS requirements to allow EIT registration as a partial substitution for bridge inspection experience would be appropriate.

Should the FHWA require certification training in proportion to the complexity of the bridge structure being inspected, and making this a part of a requirement for inspectors under the NBI program?

Federal regulations should provide the minimum requirements for the NBIS. Currently the state agencies must identify special situations requiring personnel with additional experience. It would generally be undesirable for the NBIS to add additional certification requirements for inspectors unless there are on-going significant problems with state DOT's not utilizing persons with the appropriate experience for special, or unusually complex, inspection activities.

The FHWA should consider periodic renewal of the required training for NBI program. Requiring the training to be successfully completed by bridge inspectors at least every five to eight years would be appropriate.

Should the inspector performing underwater inspections be a qualified licensed professional engineer?

The NBIS requirements for bridge inspection personnel should not be revised to require the inspector who is underwater to be a licensed engineer. The ability needed to detect structural conditions requiring attention does not necessarily change underwater, and the means are available for underwater inspectors to adequately identify, and photograph, underwater conditions for appraisal by others. If special conditions exist at a particular site, regardless if it is an underwater inspection or not, the state agency should be left to decide if additional experience is needed, beyond the minimum NBIS requirements. It is important for underwater inspectors to meet the current NBIS requirements for bridge inspectors.

Should the NBIS regulation allow only the inspector who was out in the field to change the inspection report?

It would be appropriate to disallow persons who have not visited the structure to revise the inspection report as to the description of conditions observed. Senior personnel in the inspection organization need the authority to revise any report as to conclusions drawn from the conditions observed. Senior personnel also need the ability to revise a report in its entirety if they have inspected the structure personally after the original report was written. Any revisions should bear the signature of the person making the revisions.

What improvement would you recommend to the bridge inspection procedures? What specific procedures would you recommend to enhance the NBIS regulations?

Revisions to Item 68, Deck Geometry, are needed to provide roadway widths appropriate for high ADT, but low vehicle speed, urban bridges. New urban structures built with HBRRP funds have opened with low sufficiency ratings due to limited shoulder widths. In these cases the roadway width on the bridge matches the approach roadway, and satisfies AASHTO

requirements for the urban setting. Guidelines are also needed to explain the intent and application of the “mountable curb” provisions when coding Item 68.

Revisions are needed for Item 36, Traffic Safety Features, to provide criteria that is appropriate for rural bridges with very low ADT's, and urban bridges with very low vehicle speeds. For example, new U.S. Forest Service bridges have been built that have received zeros for Item 36 on their initial inspection.

Sincerely,

John M. Unbewust
Chief Engineer

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cc: Tom Talmadge, CDOT Director of Staff Services
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